

## APACHE KAFKA COURSE CURRICULUM

### 1. Introduction to Big Data and Apache Kafka

- Introduction to Big Data
- Big Data Analytics
- Hadoop Basics
  - HDFS
  - MapReduce
  - Hive
  - HBase
  - Flume
- Need for Kafka
- What is Kafka?
- Kafka Features
- Kafka Concepts
- Kafka Architecture
- Kafka Components
- ZooKeeper
- Where is Kafka Used?
- Kafka Installation
- Kafka Cluster
- Types of Kafka Clusters
- Configuring Single Node Single Broker Cluster

Hands on:

- Kafka Installation
- Implementing Single Node-Single Broker Cluster

### 2. Kafka Producer

- Configuring Single Node Multi Broker Cluster
- Constructing a Kafka Producer
- Sending a Message to Kafka
- Producing Keyed and Non-Keyed Messages
- Sending a Message Synchronously & Asynchronously
- Configuring Producers

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- Serializers
- Serializing Using Apache Avro
- Partitions

### Hands On:

- Working with Single Node Multi Broker Cluster
- Creating a Kafka Producer
- Configuring a Kafka Producer
- Sending a Message Synchronously & Asynchronously

### 3. Kafka Consumer

- Consumers and Consumer Groups
- Standalone Consumer
- Consumer Groups and Partition Rebalance
- Creating a Kafka Consumer
- Subscribing to Topics
- The Poll Loop
- Configuring Consumers
- Commits and Offsets
- Rebalance Listeners
- Consuming Records with Specific Offsets
- Deserializers

### Hands On:

- Creating a Kafka Consumer
- Configuring a Kafka Consumer
- Working with Offsets

### 4. Kafka Internals

- Cluster Membership
- The Controller
- Replication
- Request Processing
- Physical Storage

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- Reliability
- Broker Configuration
- Using Producers in a Reliable System
- Using Consumers in a Reliable System
- Validating System Reliability
- Performance Tuning in Kafka

Hands On:

- Create topic with partition & replication factor 3 and execute it on multi-broker cluster
- Show fault tolerance by shutting down 1 Broker and serving its partition from another broker

### 5. Kafka Cluster Architectures & Administering Kafka

- Use Cases - Cross-Cluster Mirroring
- Multi-Cluster Architectures
- Apache Kafka's MirrorMaker
- Other Cross-Cluster Mirroring Solutions
- Topic Operations
- Consumer Groups
- Dynamic Configuration Changes
- Partition Management
- Consuming and Producing
- Unsafe Operations

Hands on:

- Topic Operations
- Consumer Group Operations
- Partition Operations
- Consumer and Producer Operations

### 6. Kafka Monitoring and Kafka Connect

- Considerations When Building Data Pipelines
- Metric Basics
- Kafka Broker Metrics
- Client Monitoring

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- Lag Monitoring
- End-to-End Monitoring
- Kafka Connect
- When to Use Kafka Connect?
- Kafka Connect Properties

Hands on:

- Kafka Connect

### 7. Kafka Stream Processing

- Stream Processing
- Stream-Processing Concepts
- Stream-Processing Design Patterns
- Kafka Streams by Example
- Kafka Streams: Architecture Overview

Hands on:

- Kafka Streams
- Word Count Stream Processing

### 8. Integration of Kafka With Hadoop, Storm and Spark

- Apache Hadoop Basics
- Hadoop Configuration
- Kafka Integration with Hadoop
- Apache Storm Basics
- Configuration of Storm
- Integration of Kafka with Storm
- Apache Spark Basics
- Spark Configuration
- Kafka Integration with Spark

Hands On:

- Kafka integration with Hadoop
- Kafka integration with Storm
- Kafka integration with Spark

## **APACHE KAFKA COURSE CURRICULUM**

### **9. Integration of Kafka With Talend and Cassandra**

- Flume Basics
- Integration of Kafka with Flume
- Cassandra Basics such as and KeySpace and Table Creation
- Integration of Kafka with Cassandra
- Talend Basics
- Integration of Kafka with Talend

#### **Hands On:**

- Kafka demo with Flume
- Kafka demo with Cassandra
- Kafka demo with Talend

### **10. Kafka Administration**

- Setting up and Configuring Multi Node and Zookeeper Multi Node Multi Broker Cluster
- Configuring Apache Kafka Security
- Configuring High Availability and Consistency for Apache Kafka
- Configuring Apache Kafka for Performance and Resource Management
- Viewing Apache Kafka Metrics
- Working with Apache Kafka Logs

### **11. Course Deliverables**

- Workshop style coaching
- Interactive approach
- Course material
- Hands on practice exercises for each topic
- Quiz at the end of each major topic
- Tips and techniques on Confluent Certified Developer for Apache Kafka (CCDAK)